

Simple barrier islands are dominated by storm overwash events (Fig. 9). Storm waters flowing across the island deposit large sand fans that build island elevation. Occasionally the overwash fans extend into the back-barrier estuary thus building island width and contributing to island migration (Fig. 8D, E).

History and Role of Storms

Sea level does not just gently rise and oceanic waters flood quietly across the land. Because storms are frequent and significant high energy events, they become the drivers that erode the shorelines, move the barrier islands, and cause ecosystems to migrate upward and landward (Fig. 8).

One hundred and five tropical storms and hurricanes impacted North Carolina during the 20th century (Robinson, 2005). Sixty four hurricanes made landfall between 1900 and 1999. The two decades in the 1940s and 1950s represent an active period followed by a relatively inactive period during the 1960s and 1970s. This was followed by two decades (1980s and 1990s) of frequent hurricane landfall in North Carolina.

The consequences of any given storm or series of storms vary and are generally unpredictable. Their impact upon the coastal system depends on type, size, strength, duration and forward speed of the storm, storm track, rainfall amount, storm surge height, tidal cycle, coastal elevation and orientation, and continental shelf geometry. The potential economic

impact not only depends on storm characteristics but also on land use and type and density of development. As urbanization increases, so does the potential economic loss.

Even though nor'easters are not as strong as tropical storms, they can have farreaching impacts since they are regional in extent and do not move as rapidly as hurricanes. They can build a sea state over several days and pound the coast through multiple tidal cycles (Stick, 1987). Up to 35 of these extra-tropical storms can occur every year during the fall to early spring.

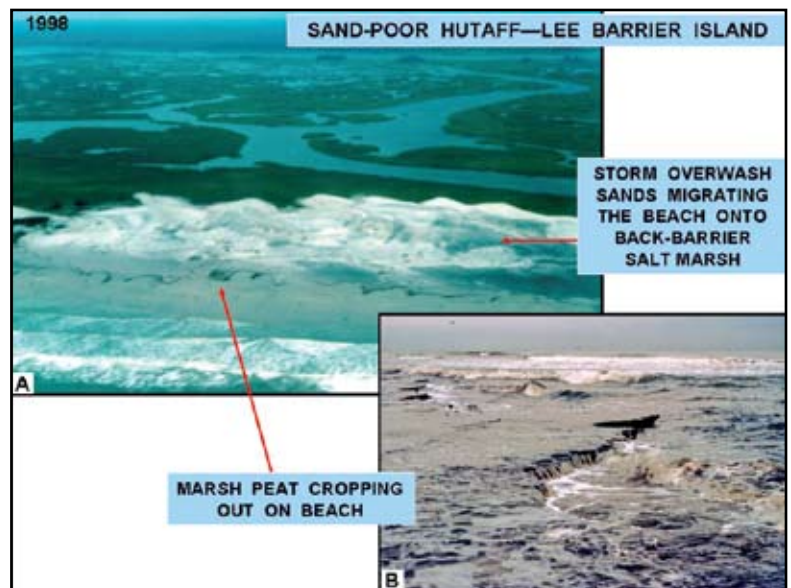


FIGURE 9. Hutaff-Lee Island is located between Figure 8 and Topsail Islands and is characteristic of what those two islands used to look like. Panel A is a 1998 oblique aerial photograph of the sediment-poor barrier island at low tide. Notice the dark line of back-barrier marsh peat along the high-tide line and the large storm overwash fan that has transported beach sand onto the back-barrier marsh, thus building island elevation. Panel B is a close-up of the marsh peat on the beach at low tide. Photographs are by S. Riggs.